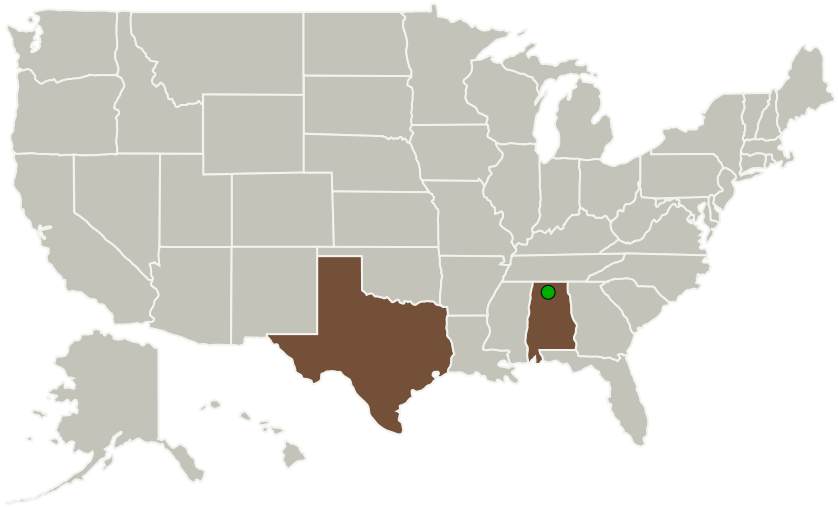
Additive Manufactured Very Light Weight Diamond Turned Aspheric Mirror, Phase I

Completed Technology Project (2017 - 2017)

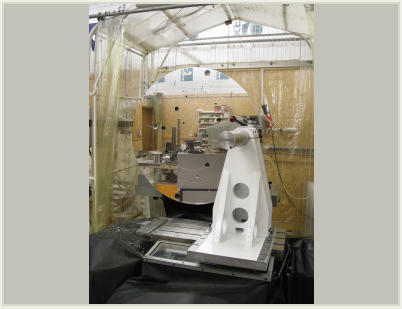
Project Introduction

The innovation proposed is a method for the fabrication of a very low cost, very light weight large aperture Al10SiMg aluminum alloy mirror by the combination of three manufacturing processes. 1. Additively manufactured mirror substrates as demonstrated in previous Phase 1 NASA SBIR S2.03-9125 with 0.2 mm contour accuracy. 2. Precision robotic welding of hexagonal on-axis and hexagonal off-axis segments to produce a larger mirror. 3. Large capacity diamond turning can produce any desired mirror aspheric contour to visible tolerances on the monolithic large mirror.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Dallas Optical Systems, Inc.	Lead Organization	Industry Veteran-Owned Small Business (VOSB)	Rockwall, Texas
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama



Additive Manufactured Very Light Weight Diamond Turned Aspheric Mirror, Phase I Briefing Chart Image

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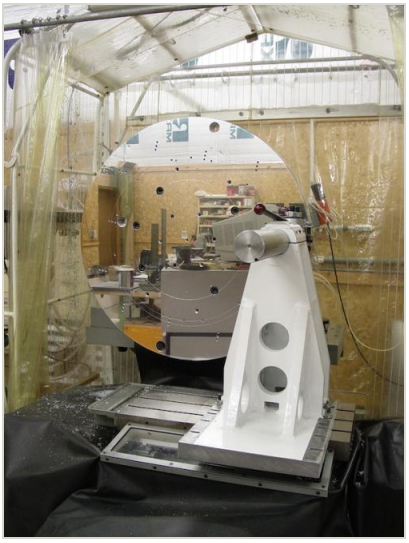
Primary U.S. Work Locations	
Alabama	Texas

Images



Briefing Chart Image
Additive Manufactured Very Light Weight Diamond Turned Aspheric Mirror, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/126110)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Dallas Optical Systems, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

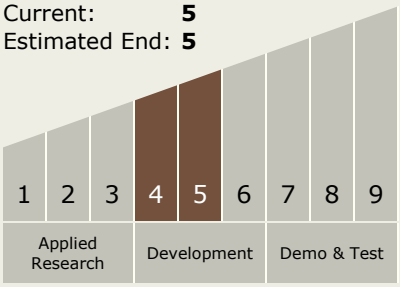
Carlos Torrez

Principal Investigator:

John M Casstevens

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Completed Technology Project (2017 - 2017)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.2 Observatories
    - TX08.2.1 Mirror Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System